REMARKS

Applicants address the examiner's remarks in the order presented in the Office Action (dated June 17, 2005). All claim amendments are made without prejudice and do not represent acquiescence in any ground of rejection.

STATUS OF CLAIMS

Claims 1-24, 26-36, and 38-40 are pending in the application. Claims 2-4, 6-8, 11-16, 19-23, 25, 27, 28, and 36-68 are cancelled. Claims 8, 11-16, 2-23, and 38-40 were cancelled as being direct to non-elected inventions. Claims 1, 5, 9, 10, 17, 24, 26, and 29-36 have been amended. The language from cancelled claims 2-4, 9 and 36 was incorporated into amended claim 1. The amendments to claims 5, 9, 10, 17, 24, 26, 29-35 correct typographical errors. Claim amendments are for purposes of improved clarity or consistency of claim language unless otherwise noted. No claim amendment should be construed as acquiescence in any ground of rejection. No new matter has been added by this amendment.

Claims 2-4, 6, 17-19, 27, 28 and 31 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Claims 1-7, 9, 10, 17-19, 24, 26-36 stand rejected under 35 U.S.C. §102(b) as being anticipated by Lerner *et al.* (U.S. 5,601,992).

Claims 1-7, 9, 10, 17-19, 24, and 26-36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lerner *et al.* (US 5,601,992) and Bjornson *et al.*, (US 6,284,113 B1, priority to 19 September 1997).

CLAIM OBJECTIONS

Claims 27 and 28 were objected to for depending from canceled claim 25. Applicants have canceled claims 27 and 28 without prejudice to expedite prosecution thereby rendering the objection moot.

REJECTIONS UNDER 35 USC § 112, SECOND PARAGRAPH - INDEFINITENESS

Claims 2-4, 6, 17-19, 27, 28, and 31 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite.

Applicants canceled 2-4, 6, 18, 19, 27, 28, and 31 without prejudice. Applicants amended claim 17 for further clarity and consistency of claim language. In view of the claim amendments, Applicants respectfully request reconsideration of the claims as amended. Therefore, Applicants ask that the rejection of claims 2-4, 6, 17-19, 27, 28, and 31 under 35 U.S.C. § 112, second paragraph, be withdrawn.

REJECTIONS UNDER 35 USC § 102(B) - ANTICIPATION

Claims 1-7, 9, 10, 17-19, 24, 26-36 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Lerner *et al.* (U.S. 5,601,992).

This rejection is overcome in part by amendment to the claims and in part is traversed as discussed below. As indicated above, Applicants have amended the claims for greater clarity and consistency of claim language, incorporating all of the limitations claims 2-4, 9 and 36 into claim 1.

The standard for anticipation is rigorous requiring that every element of the claimed invention, as arranged in the claim, be disclosed either specifically or inherently by a single prior art reference. See Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559, 1565 (Fed.Cir.1992); Scripps, 927 F.2d at 1576-77; Lindemann

Maschinenfabrik GMBH, v. American Hoist & Derrick Co., 730 F.2d 1452, 1458 (Fed.Cir.1984). Every element of the challenged claim need not be expressly delineated in the single prior art reference, but may be inherently disclosed by prior art if "the prior art necessarily functions in accordance with the limitations" of the challenged claim. King, 801 F.2d at 1326; see also Standard Havens Prods., Inc. v. Gencor Indus., Inc., 953 F.2d 1360, 1369 (Fed.Cir.1991), cert. denied, 506 U.S. 817, 113 S.Ct. 60, 121 L.Ed.2d 28 (1992).

Lerner does not either specifically (expressly) or inherently disclose every element of the claimed invention, as represented by the amended claims. The examiner must clearly show that every element of the claims is disclosed in Lerner. While the examiner does summarize Lerner, Applicants submit that Lerner fails to anticipate each and every limitation of the amended claims.

Lerner does not teach each and every limitation of amended claim 1: A method for screening for analytes comprising the steps of: a) disposing a plurality of analytes to be screened within individually identifiable containers such that the analytes remain isolated from each other, wherein the individually identifiable containers are an array of capillary tubes each of which is identifiable according to its position within the array; b) dispensing the analytes through the open ends of the capillary tubes onto at least one solid support to maintain the transferred contents of each container separate from those of each other container, wherein said analytes are simultaneously applied onto the at least one solid support, wherein each analyte when applied to the solid support diffuses thereon so as to produce a concentration gradient; c) contacting said at least one analyte-carrying solid support with targets provided in a semi-solid or liquid medium, whereby said analytes are released from the at least one solid support to the targets; and d) measuring analyte-target

interactions, wherein said analyte-target interactions are measured using one or more of the following methods: microscopic, luminometric, densitometric, isotopic, and physical measurements.

The examiner is of the opinion that Lerner allegedly teaches pigment dispersion and that this allegedly reads on the limitations of claim 36. Lerner discloses the use of melanocytes as a means to measure binding activity, Applicants have the following comment. Microscopic, luminometric, densitometric, isotopic means of measuring binding to a cell surface is not taught by Lerner, as microscopic, luminometric, densitometric, and isotopic means do not necessarily involve measuring a direct change in cellular appearance as described by Lerner.

Lerner is also silent regarding whether or not each analyte when applied to the solid support diffuses thereon so as to produce a concentration gradient as claimed in amended claim 1.

Applicants submit that the amended claims are not anticipated by Lerner *et al.* Without acceding to the propriety of the rejection of pending claims 1, 5, 9, 10, 24, 26, 29, 30, and 32-26 under 35 U.S.C. § 102(b) as allegedly being anticipated by Lemer *et al.* (U.S. 5,601,992), Applicants respectfully request reconsideration of the claims as amended. For these reasons, Applicants request the examiner to withdraw the rejection of pending claims 1, 5, 9, 10, 24, 26, 29, 30, and 32-26 under 35 U.S.C. § 102(b).

REJECTIONS UNDER 35 USC § 103(A) – OBVIOUSNESS

Claims 1-7, 9, 10, 17-19, 24, and 26-36 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Lerner *et al.* (US 5,601,992) and Bjornson *et al.*, (US 6,284,113 B1, priority to 19 September 1997).

This rejection is overcome in part by amendment to the claims and in part is traversed as discussed below. Applicants canceled 2-4, 6, 9, 18, 19, 27, 28, and 31 without prejudice. Applicants amended claim 17 for further clarity and consistency of claim language. As indicated above, Applicants have amended the claims for greater clarity and consistency of claim language, incorporating all of the limitations claims 2-4, and 36 into claim 1.

The claims, as amended, are drawn to Lerner does not teach each and every limitation of amended claim 1: A method for screening for analytes comprising the steps of: a) disposing a plurality of analytes to be screened within individually identifiable containers such that the analytes remain isolated from each other, wherein the individually identifiable containers are an array of capillary tubes each of which is identifiable according to its position within the array; b) dispensing the analytes through the open ends of the capillary tubes onto at least one solid support to maintain the transferred contents of each container separate from those of each other container, wherein said analytes are simultaneously applied onto the at least one solid support, wherein each analyte when applied to the solid support diffuses thereon so as to produce a concentration gradient; c) contacting said at least one analyte-carrying solid support with targets provided in a semi-solid or liquid medium, whereby said analytes are released from the at least one solid support to the targets; and d) measuring analyte-target interactions, wherein said analyte-target interactions are measured using one or more of the following methods: microscopic, luminometric, densitometric, isotopic, and physical measurements.

The examiner stated that Lerner *et al.* discloses a method that reads on that of the instant claims. Specifically, the examiner stated that the Lerner discloses detecting the interaction between an oligomeric molecule (reading on claimed analyte) and a target (*see*,

e.g., Abstract). In the method of Lerner *et al.*, a plurality of beads containing peptide analytes are applied to a substrate surface and allowed to diffuse therein (see, *e.g.* column 21, lines 33-66 –"[t]he oligomeric molecules diffuse through the substrate and interact with a target"). This reads on the claimed step b) of releasing the analytes from the solid supports. The reference also reads on step a) of having analytes on at least one solid support in an isolated fashion, see, for example, column 3, lines 5-22). Beads as solid supports are used for the peptide analytes and the interaction tests were run in culture dishes (see, *e.g.* Examples 1 & 3 of the reference), this reads on the supports recited in the instant claims. The culture dishes of the reference have gels thereon, see, for example, column 29, lines 62-66. This reads on a coated solid support as recited in the instant claims. The peptide analytes and their preparations (see, *e.g.* Example 1) read on the analytes recited in instant claims 29, 30 and 32. Various cellular targets are also described by the reference (see Example 2 and column 21, line 66 - column 22, line 67) reading on claim 33. In the reference, pigment dispersion is measured (see, *e.g.*, column 25, line 55 - column 26, line 52); this reads on the limitations of instant claim 36.

However, the examiner stated that Lerner *et al.* does not teach methods according to claim 1, wherein step (a) comprises (i) disposing the analytes within individually identifiable containers, and (ii) transferring the analytes from the containers to the at least one solid support in such a manner as to maintain the transferred contents of each container separate from those of each other container, (as in claim 2); wherein the individually identifiable containers are an array of capillary tubes, including capillary tubes, pens, including plotter pens, and print heads, (as in claim 3); wherein the individually identifiable containers are an array of capillary tubes each of which is identifiable according to its position within the array,

and wherein transfer of the analytes to the at least one solid support occurs by dispensing thereof through the open ends of the capillary tubes, (as in claim 4); wherein the solid support is an information carrier which carries information in electronic, magnetic or digitized form, (as in claim 18); wherein each analyte-bearing solid support is contacted in step b) with a target provided from a separate compartment of a multi-compartmented apparatus, (as in claim 27); wherein said compartments are an arrangement of mini-wells in said apparatus, (as in claim 28); and wherein the analyte dissolves in a solvent, wherein said solvent includes gelatin, polysaccharides such as agar and agarose, natural and synthetic polymers such as methylcellulose, polyacrylamide, hydrogels, gels containing N-isopropylacrylamide, or thermo-sensitive polymers, such that each analyte following application to the solid support and drying, liquefies in response to said chemical or physical parameter, (as in claim 31).

According to the examiner, Bjornson *et al.* satisfies the deficiencies of Lerner. More specifically, the examiner stated that Bjornson *et al.*, throughout the patent and abstract, teach methods wherein analytes or beads may be disposed within individually identifiable containers within; microarray plates, and transferring the analytes or beads from the containers to microarray substrates in such a manner as to maintain the transferred contents of each container separate from those of each other container in the other microarray, (as in claim 2); wherein the microarrays comprise individually identifiable containers are in an array (*e.g.*, col. 19, line 13; col. 20, line 13, Fig. 6-8) of capillary tubes, including capillary tubes, and channels of capillary dimensions (col. 8, line 64-col. 9, line 4; col. 11, lines 6-10; col. 15, line 40-col. 16, line 67), (as in claim 3); wherein the microarray plates comprise individually identifiable cavity structures, reading on containers, and arrays of capillary channels, reading on capillary tubes, each of which is identifiable according to its position within the microfluidic network

plate, and further comprising a array of microfluidic networks, and wherein transfer of the analytes to the at least one solid support occurs by dispensing thereof through apertures that are the open ends of the capillary channels (*e.g.*, Fig. 4A, col. 16, lines 18-54), (as in claim 4); at col., *e.g.*, col. 20, lines 46-53, teach microarray plates reading upon a solid support, wherein the microarray plates are information carriers which carry information in electronic and digitized form, (as in claim 18); wherein each analyte-bearing solid support is contacted in step b) with a target provided from a separate compartment of a microarray plate that is a multi-compartmented apparatus, (as in claim 27); wherein said compartments are an arrangement of mini-wells in said apparatus, (as in claim 28); and at col. 9, lines 23-55, teach electroflow media, reading on solvents, wherein said media includes polysaccharides, agarose, natural and synthetic polymers such as methylcellulose, polyacrylamide, hydrogels. Bjornson *et al.*, at col. 18, lines 24-61, especially lines 56-59; col. 30, line 56-col. 31, line 14, disclose the manipulation of bead and particles in the channels of their disclosed microfluidic arrays. Bjornson *et al.* at col. 29, line 66-col. 30, line 14, teach using microfluidic processing for assay that determining specific binding pair members, as in determining an analyte, and including cell surface binding assays, assays for drug discovery and screening, and studies of receptors.

According to the examiner, it would have been *prima facie* obvious at the time of the invention for one of ordinary skill in the art to have used methods comprising methods of screening of analytes, comprising applying a plurality of analytes onto solid supports, such that the analytes remain isolated from one another, and wherein the analytes are released after contact of the analyte-carrying solid supports; and wherein the analytes are disposed within individually identifiable containers, and transferring the analytes from the containers to the at least one solid support in such a manner as to maintain the transferred contents of each

container separate from those of each other container, (as in claim 2); wherein the individually identifiable containers are an array of capillary microarray plates are information carriers which carry information in electronic and digitized form, (as in claim 18); wherein each analyte-bearing solid support is contacted in step b) with a target provided from a separate compartment of a microarray plate that is a multi-compartmented apparatus, (as in claim 27); wherein said compartments are an arrangement of mini-wells in said apparatus, (as in claim 28); and at col. 9, lines 23-55, teach electroflow media, reading on solvents, wherein said media includes polysaccharides, agarose, natural and synthetic polymers such as methylcellulose, polyacrylamide, hydrogels. Bjornson *et al.*, at col. 18, lines 24-61, especially lines 56-59; col. 30, line 56-col. 31, line 14, disclose the manipulation of bead and particles in the channels of their disclosed microfluidic arrays. Bjornson *et al.* at col. 29, line 66-col. 30, line 14, teach using microfluidic processing for assay that determining specific binding pair members, as in determining an analyte, and including cell surface binding assays, assays for drug discovery and screening, and studies of receptors.

The examiner believes it would have been *prima facie* obvious at the time of the invention for one of ordinary skill in the art to have used methods comprising methods of screening of analytes, comprising applying a plurality of analytes onto solid supports, such that the analytes remain isolated from one another, and wherein the analytes are released after contact of the analyte-carrying solid supports; and wherein the analytes are disposed within individually identifiable containers, and transferring the analytes from the containers to the at least one solid support in such a manner as to maintain the transferred contents of each container separate from those of each other container, (as in claim 2); wherein the individually identifiable containers are an array of capillary tubes, (as in claim 3); wherein the individually

identifiable containers are an array of capillary tubes each of which is identifiable according to its position within the array, and wherein transfer of the analytes to the at least one solid support occurs by dispensing thereof through the open ends of the capillary tubes, (as in claim 4); wherein the solid support is an information carrier which carries information in electronic or digitized form, (as in claim 18); wherein each analyte-bearing solid support is contacted in step b) with a target provided from a separate compartment of a multi-compartmented apparatus, (as in claim 27); wherein said compartments are an arrangement of mini-wells in said apparatus, (as in claim 28); and wherein the analyte dissolves in a solvent, wherein said solvent includes polysaccharides, agarose, natural and synthetic polymers, methylcellulose, polyacrylamide, hydrogels, such that each analyte following application to the solid support and drying, liquefies in response to said chemical or physical parameter, (as in claim 31).

According to the examiner, one of ordinary skill in the art would have been motivated to use methods of screening analytes, wherein the analytes are beads comprising oligomeric molecules, wherein the beads are applied to a substrate, as taught by Lerner (see, *e.g.*, Lerner at col. 21, lines 33-43); and wherein the bead/analytes are manipulated in microarray plates that comprise compartments and capillary tubes, wherein the microarray plates are solid supports that are electronic, digital information carriers and further comprising media, as taught by Bjornson above, because Bjornson teaches manipulation of analytes or beads within microarray plates, and Bjornson teaches evaluating analyte binding to cell surfaces, for example, in order to identify specific binding pairs, and so to screen for potential drugs that target cell surface receptors.

The examiner is of the opinion that one of ordinary skill in the art would have had a reasonable expectation of success in using bead analytes applied onto substrates, wherein those substrates are electronic microarrays comprising compartments, capillary tubes, and

media, because, absent evidence to the contrary, beads or particles that release compounds into solution were known in the medicinal arts and because flowing particles through such arrays, absent evidence to the contrary, were known in the microfluidic arts.

Regarding Bjornson, the examiner stated that Bjornson teaches transmitting electronic and digitized information in a manner analogous to the instant application; however, Bjornson discloses using an electronic means to control the release of liquid from a microfluidic network. In contrast, Applicants' invention as claimed gathers data via an electronic, magnetic or digitized means. Therefore Applicants state that the process of data gathering in the instant application is not obvious in view of Lerner. Applicants request that the examiner provide further clarification of Bjornson's teaching in view of Applicants' comments above.

Applicants point out that claims cannot be found obvious unless the prior art itself suggests the desirability of the combination. *Berghauser v. Dann,* 204 U.S.P.Q. 393 (D.D.C. 1979); *ACS Hospital Systems Inc., v. Montefiore Hospital,* 221 U.S.P.Q. 929 (Fed. Cir. 1984). There must be something in the prior art that would have motivated persons of ordinary skill to make the combination. *In re Stencel,* 4 U.S.P.Q.2d 1071 (Fed. Cir. 1987), *accord, Ex parte Marinaccio,* 10 U.S.P.Q.2d 1716 (Pat. Off. Bd. App. 1989)(combining references is improper absent some teaching, suggestion, or motivation for the combination in the prior art).

Obviousness cannot be established by merely showing that it would have been possible for a person of ordinary skill to combine or modify teachings of the prior art. The prior art must suggest the desirability of the claimed invention. MPEP 2143.01. Moreover, there must be affirmative evidence that such a person would have been **"impelled"** to make the combination. *Ex parte Levengood,* 28 U.S.P.Q.3d 1300, 1302 (Pat. Off. Bd. App.

1993)(citations omitted). As is stated in M.P.E.P. § 2143, three criteria must be met to establish *prima facie* obviousness:

> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Moreover, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one ordinary skill in the art. MPEP § 2143.01.

Here, a *prima facie* case of obviousness has not been established, at least because there is no suggestion or motivation to modify the references and the references when combined, do not teach or suggest all the claim limitations of the currently pending, amended claims (as discussed above). Applicants comments above under 35 U.S.C. §102(b) as allegedly being anticipated by Lerner *et al.* (U.S. 5,601,992) are applicable here. As stated above, the cited references do not teach the claimed invention, and even if combined, one of skill would not be able to arrive at the subject matter as claimed in the claims or disclosed in the instant specification.

Indeed, it is clear that the motivation for preparing the claimed method comes not from the cited references, *but from the application itself.* A proper *per se* obviousness rejection cannot rely on the application to find the motivation to modify the prior art, as this

is a hallmark of impermissible hindsight reasoning. In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999). Moreover, the examiner must show reasons that the skilled artisan would select the elements from the cited prior art references for combination in the manner claimed. In re Rouffet, 149 F.3d 1350, 1357 (Fed. Cir. 1998). The examiner cannot rely on Applicants invention to find any motivation to combine the cited references.

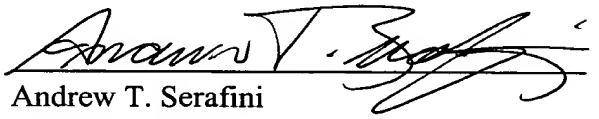
Without acceding to the propriety of the rejection of pending claims 1-7, 9, 10, 17-19, 24, and 26-36 under 35 U.S.C. § 103(b) as allegedly unpatentable over Lerner *et al.* (US 5,601,992) and Bjornson *et al.*, (US 6,284,113 B1, priority to 19 September 1997). Applicants respectfully request reconsideration of the claims as amended.

Applicants canceled 2-4, 6, 9, 18, 19, 27, 28, and 31 without prejudice. Applicants amended claim 17 for further clarity and consistency of claim language. As indicated above, Applicants have amended the claims for greater clarity and consistency of claim language, incorporating all of the limitations claims 2-4, 9 and 36 into claim 1. In view of the claim amendments, Applicants respectfully request reconsideration of the claims as amended. Therefore, Applicants ask that the rejection of claims 1-7, 9, 10, 17-19, 24, and 26-36 under 35 U.S.C. § 103(b), be withdrawn.

The foregoing represents a *bona fide* attempt to advance the present case to allowance. Applicants submit that this application is now in condition for allowance. Accordingly, an indication of allowability and an early Notice of Allowance are respectfully requested.

If the examiner believes that a telephone conference would expedite prosecution of this application, please telephone the undersigned at 206-332-1380.

Date: September 14, 2005



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